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EXAMINER	
KIM, DAVID S	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.**	**Applicant(s)**	
	10/781,006	JUNG ET AL.	
	Examiner	**Art Unit**	
	DAVID S. KIM	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-13,15,17 and 18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,9-13,15,17 and 18* is/are rejected.

7)☒ Claim(s) *2,3 and 5-8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. **Claims 1, 9-13, 15, and 18** are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 6 of U.S. Patent No. 7,149,431 B2, hereinafter "Jung431" in view of Peng et al. ("A tunable dual-wavelength erbium-doped fiber ring laser using a self-seeded Fabry-Perot laser diode", hereinafter "Peng"), Li et al. ("Actively mode-locked erbium fiber ring laser using a Fabry-Perot semiconductor modulator as mode locker and tunable filter", hereinafter "Li"), claim 9 of Jung431, Yamamoto et al. (U.S. Patent No. 5,930,015, hereinafter "Yamamoto"), and Darcie et al. (U.S. Patent No. 5,559,624, hereinafter "Darcie").

Regarding claim 1, claim 6 of Jung431 discloses the following details of the "multi-wavelength lasing source":

the multiplexing/demultiplexing unit (Jung431, col. 7, l. 50-51, "wavelength division multiplexer"),

the plurality of reflectors (Jung431, col. 7, l. 53, "Fabry-Perot lasers" comprise reflectors)

the laser diode (Jung431, col. 8, l. 26, "laser diode"),

first (Jung431, col. 8, l. 19, "second splitter") and second optical distributors (Jung431, col. 7, l. 59, "first splitter"),

the circulator (Jung431, col. 7, l. 43, "optical circulator"),

the first optical amplifier (Jung431, col. 8, l. 11, "amplifying optical fibers") coupled to the first optical distributor (Jung431, col. 8, l. 19-20, the "second splitter" is coupled to the "amplifying optical fibers"),

said multiplexing/demultiplexing unit coupled to the circulator (Jung431, col. 7, l. 50-58).

Claim 6 of Jung431 does not expressly disclose the following details of the "multi-wavelength lasing source":

the first optical amplifier coupled ***to the circulator*** and the first optical distributor ***and the second optical distributor***,

the filter coupled to the circulator and a second optical amplifier.

Regarding the coupling "***to the circulator***", notice that, in claim 6 of Jung431, there is an "optical waveguide loop" (Jung431, col. 7, l. 44) and that the first optical amplifier and the circulator both process the light circulating in this loop (Jung431, col. 7, l. 43-47). One can imagine various configurations that fit this description of components of claim 6 of Jung431. Notice the configuration of arranging both the first optical amplifier and the circulator as part of the "optical waveguide loop", as exemplified by Peng (Fig. 1). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement such an arrangement. One of ordinary skill in the art would have been motivated to do this since Peng's arrangement is used to employ the same functional principles of claim 6 of Jung431. That is, notice that both employ the same functional principle of "self-seeding" (Peng, title; Jung431, col. 7, l. 55). Thus, one of ordinary skill in art interested in practicing the apparatus of claim 6 of Jung431 would obviously incorporate aspects of the arrangement of Peng to employ the common functional principles of "self-seeding". Accordingly, an obvious variation of the apparatus of claim 6 of Jung431 in view of Peng would include the first optical amplifier coupled ***to the circulator*** (Peng, Fig. 1, erbium doped fiber amplifier coupled to the circulator; the coupling may be through the 90:10 coupler, or the coupler may be suitably placed after the circulator in an obvious variation).

Regarding the coupling "***to the second optical distributor***", notice that, in view of Peng, there would be two location choices for ***the second optical distributor*** of claim 6 of Jung431 in view

of Peng. That is, ***the second optical distributor*** of claim 6 of Jung431 (col. 7, l. 59, "first splitter") is coupled "to the optical circulator via ***one of*** the plurality of ports" (Jung431, col. 7, l. 59-60) "for outputting light circulating in an optical waveguide loop" (Jung431, col. 7, l. 43-44). In view of Peng, there would be two location choices that fit this description. One would be port 2 in Fig. 1 of Peng, which would not be part of the optical waveguide loop. The other would be port 3 in Fig. 1 of Peng, which would be part of the optical waveguide loop. Either location would provide a suitable choice. Moreover, Li shows the choice of using the port of a circulator that is part of an optical waveguide loop (Li, Fig. 1, left port of the circulator). Accordingly, an obvious variation of the apparatus of claim 6 of Jung431 in view of Peng and Li would include the first optical amplifier coupled ***to the circulator*** (as discussed above in view of Peng) and the first optical distributor (Jung431, col. 8, l. 19-20, the "second splitter" is coupled to the "amplifying optical fibers") ***and second optical distributor*** (as discussed in view of Peng and Li).

Regarding "***the filter coupled to the circulator and a second optical amplifier***", notice that claim 9 of Jung431 discloses a filter (Jung431, col. 8, l. 42) coupled to a second optical amplifier (Jung431, col. 8, l. 43-44). This filter and second optical amplifier would also be part of the optical waveguide loop since they are part of the optical fiber amplifier of claim 9 of Jung431 (Jung431, col. 8, l. 43-44, "located between the first and second amplifying optical fibers", which are part of the "optical fiber amplifier" of col. 8, l. 10), which is part of the optical waveguide loop of claim 9 of Jung431 (Jung431, col. 7, l. 45-47). Placement of the circulator in different locations along the optical waveguide loop would provide obvious variations, including the location before the filter so that ***the filter*** would be ***coupled to the circulator and a second optical amplifier.***

The previous discussion addresses the limitations of the "multi-wavelength source" of Applicant's claim 1. The following discussion addresses the other limitations of the network of claim 1. Claim 6 of Jung431 in view of Peng, Li, and claim 9 of Jung431 does not disclose the following limitations, but Yamamoto does:

the central office (Yamamoto, left side in Fig. 24),

the plurality of subscriber terminals (Yamamoto, implied plurality of terminals on right side) for transmitting an upward signal using a reflected signal (Yamamoto, signals reflect in amplifiers of Fig. 24,

as shown by semiconductor laser amplifier in Fig. 2) of a multi-wavelength signal transmitted from the central office;

the local office (Yamamoto, 221 in Fig. 24) disposed between the central office and the subscriber terminals via optical fibers for demultiplexing the multi-wavelength signal transmitted from the central office and for multiplexing signals from each of the subscriber terminals; and

the second circulator (Yamamoto, circulator in Fig. 24) coupled to the local office.

The teachings of Yamamoto concern an entire optical communication system that employs a multi-wavelength optical signal (Yamamoto, Fig. 24, output from 223). The output of the "multi-wavelength lasing source" of claim 6 of Jung431 in view of Peng, Li, and Claim 9 of Jung431 is also a multi-wavelength optical signal. Clearly, one would obviously employ this "multi-wavelength lasing source" in any suitable system that is designed to employ a multi-wavelength optical signal, such as the system of Yamamoto. One suitable motivation for such a combination would be cost concerns. That is, Yamamoto discloses a plurality of wavelength lasing sources in Fig. 24 which would generally be more expensive than the single lasing source of claim 6 of Jung431 in view of Peng, Li, and claim 9 of Jung431 (Jung 431, col. 8, l. 26, "laser diode").

In such a combination of teachings, claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, and Yamamoto would then disclose:

wherein the lasing source further comprises a second circulator (Yamamoto, circulator in Fig. 24) coupled to ***the second optical distributor*** (the circulator in Fig. 24 of Yamamoto is coupled to the output of a multi-wavelength optical signal, which is "the second optical distributor", a.k.a. the "first splitter", of Jung431, col. 7, l. 59) and the local office (Yamamoto, 221 in Fig. 24).

However, claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, and Yamamoto does not expressly disclose:

wherein the lasing source further comprises a second circulator coupled to ***said multiplexing/demultiplexing unit***, the second optical distributor and the local office.

Rather, the second circulator (Yamamoto, circulator in Fig. 24) is coupled to *another* demultiplexing unit (Yamamoto, 2nd optical coupler-splitter in Fig. 24), this one for upstream signals. However, the use of *one* multiplexing/demultiplexing unit for upstream and downstream signals is known in the art, as exemplified by Darcie (95 in Fig. 1). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to employ the *same* multiplexing/demultiplexing unit in the apparatus of claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, and Yamamoto for upstream *and* downstream signals. One of ordinary skill in the art would have been motivated to do this to economically use only one multiplexing/demultiplexing unit instead of the two shown in Fig. 24 of Yamamoto. Moreover, integrating multiple units into one unit is a common practice throughout the field of art for the common benefits of integration, such as economies of scale and smaller footprint.

Regarding claim 9, claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, Yamamoto, and Darcie discloses:

A wavelength-division-multiplexed passive optical network as claimed in claim 1, wherein the subscriber terminal includes a reflective optical amplification means (Yamamoto, semiconductor laser amplifier in Fig. 2).

Regarding claim 10, claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, Yamamoto, and Darcie discloses:

A wavelength-division-multiplexed passive optical network as claimed in claim 9, wherein the reflective optical amplification means is a reflective semiconductor optical amplifier (Yamamoto, semiconductor laser amplifier in Fig. 2).

Regarding claim 11, claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, Yamamoto, and Darcie discloses:

A wavelength-division-multiplexed passive optical network as claimed in claim 10, wherein the reflective semiconductor optical amplifier comprises an anti-reflection coating face formed on one side (Yamamoto, 47 in Fig. 5), a high-reflection coating face formed on another side (46), and a gain medium formed between the anti-reflection coating face and the high-reflection coating face (medium between 46 and 47), so that the semiconductor optical amplifier total-reflects a signal inputted through the anti-

reflection coating face by the high-reflection coating face and outputs the total-reflected signal (output 36).

Regarding claim 12, claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, Yamamoto, and Darcie discloses:

A wavelength-division-multiplexed passive optical network as claimed in claim 11, wherein the semiconductor optical amplifier further amplifies and modulates the signal when the signal passes the gain medium (Yamamoto, col. 7, l. 55-62).

Regarding claim 13, claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, Yamamoto, and Darcie discloses:

A wavelength-division-multiplexed passive optical network as claimed in claim 9, wherein the subscriber terminal further comprises an optical distributor (Yamamoto, 224 in Fig. 24) and a broadcasting data optical receiver (Yamamoto, μ receiver) so as to receive a broadcasting service signal, the optical distributor distributing downward signals inputted from the local office to the reflective optical amplification means and the broadcasting data optical receiver.

Regarding claim 15, claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, Yamamoto, and Darcie discloses:

A wavelength-division-multiplexed passive optical network as claimed in claim 1, wherein the lasing source further comprises an upward data receiver (optical receivers on the left side of Fig. 24 of Yamamoto in view of the single multiplexer/demultiplexer unit teachings of Darcie applied above in the treatment of claim 1 above) coupled to said multiplexer/demultiplexer unit.

Regarding claim 18, claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, Yamamoto, and Darcie discloses:

A wavelength-division-multiplexed passive optical network as claimed in claim 9, wherein the subscriber terminal further comprises:

a broadcast reception optical receiver (Yamamoto, μ receiver in Fig. 24); and

an optical distributor (Yamamoto, 224 in Fig. 24) coupled to the reflective optical amplification means (Yamamoto, amplifier in Fig. 24), the broadcast reception optical receiver (Yamamoto, μ receiver) and the local office (221 in Fig. 24).

3. **Claim 17** is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, Yamamoto, and Darcie, as applied to the claims above, and further in view of Iannone et al. (U.S. Patent No. 6,147,784, hereinafter "Iannone").

Regarding claim 17, claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, Yamamoto, and Darcie does not expressly disclose:

A wavelength-division-multiplexed passive optical network as claimed in claim 1, wherein an external modulator is coupled between the second circulator and the second optical distributor.

However, consider the external modulator shown by Iannone (shared gain section 23 in Figs. 1-2). This external modulator modulates a multi-wavelength lasing light outputted from a multiplexing/demultiplexing unit (22' output from 22 in Figs. 1-2). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to provide such an external modulator in the apparatus of claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, Yamamoto, and Darcie. One of ordinary skill in the art would have been motivated to do this since it provides the benefit of providing broadcast signals without requiring an additional light source (Iannone, col. 2, l. 5-8). Additionally, a suitable location for this external modulator would be at some point that carries a multi-wavelength lasing light. In the apparatus of claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, Yamamoto, and Darcie, such suitable locations would include the location between the second circulator and the second optical distributor. That is, this location corresponds well with the location in Iannone since this location carries a multi-wavelength lasing light in both Iannone (Iannone, 22' output from 22 in Figs. 1-2) and in claim 6 of Jung431 in view of Peng, Li, claim 9 of Jung431, Yamamoto, and Darcie (after "the second optical distributor", a.k.a. the "first splitter", of Jung431, col. 7, l. 59), Accordingly, placing the external modulator in this location would constitute an obvious variation.

Allowable Subject Matter

4. **Claims 2, 3, and 5-8** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

5. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection. In particular, notice the new double patenting rejections.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Abeles (U.S. Patent No. 6,192,058 B1) is cited to show various configurations of a laser resonator of a multi-wavelength lasing source (Figs. 4a-4h).

Chow et al. ("Multiwavelength generation in an erbium-doped fiber laser using in-fiber comb filters") is cited to show a multi-wavelength lasing source having a comb filter (Fig. 1).

Talaverano et al. ("Multiwavelength fiber laser sources with Bragg-grating sensor multiplexing capability") is cited to show a multi-wavelength lasing source having a multiplexing/demultiplexing unit and a plurality of reflectors (Fig. 1).

Takahashi et al. ("Multiwavelength ring laser composed of EDFAs and an arrayed-waveguide wavelength multiplexer") is cited to show a multi-wavelength lasing source having a multiplexing/demultiplexing unit (Fig. 1).

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID S. KIM whose telephone number is (571)272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth N. Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. S. K./
Examiner, Art Unit 2613

/Kenneth N Vanderpuye/
Supervisory Patent Examiner, Art Unit 2613